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## 7.2 Management Comments (1)

- The Committee endorses DOE proceeding with CD-1 for the DECam project.
- It is unlikely that the DECam Project will be ready for CD-3 to occur simultaneously with CD-2..
- The documentation is thorough for DECam, particularly for project at the CD-1 stage. CFIP appears adequate and DESDH needs strengthening.
- The mechanism for providing oversight of the project at the agency level needs to be documented (e.g. Joint Oversight Group).
- Before the DES Project as a whole, and DECam in particular, can be baselined a complete set of MOUs with annually revised statements of work need to be executed.



## 7.2 Management Comments (2)

- Another approach to tracking progress is to supplement the EVMS with aggressive milestone monitoring. This is achieved by developing a sufficiently dense set of milestones (one would expect ~1 Level-2 milestone/month and each successively lower level should increase in number milestone by a factor ~5-10), as well as a complete list of the floats associated with all of these milestones.
- Systems engineering and integration is an area that requires significant attention at this stage of all three projects comprising the DES Project.
  - A project engineer is indicated as being needed to be added to the DECam project
  - A strong integrating and system resource support is needed at the overall DES Project level in order to ensure that interfaces, requirements,
    - This extends to overall error budgets being assigned and carefully monitored for all three projects (cf. Section 3.4)
    - Cooling approach interactions between DECam and CFIP
    - Tradeoff between CCD noise acceptability and electronics noise



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## 7.2 Management Comments (3)

- The *Science Requirements and Technical Specifications*, should be divided into at least two documents.
- The community pipeline is not defined at this point and is not in any budget, but it is not part of the project nor essential to the success of the DES project. However, it is necessary in order to get the observing time.
- The DES Project Director has done a remarkable job
- The DECam project manager has established a basis for a well controlled and managed project
- Strong project management is required in all projects within the DES Project.



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## 7.3 Management Recommendations (1)

1. Determine whether it is feasible and justified to seek a simultaneous CD-2 and CD-3 review or revise project plan to reflect staggered CD-2/CD-3 and potentially the use of partial critical decisions (e.g. CD-2a/b; CD-3a/b) and get DOE concurrence.
2. Develop and finalize a complete set of MOUs with annually revised appendices describing scope of work and management details at all necessary levels of the DES project before the DES Project review for CD-2. These MOUs must include the principal laboratory directors MOU (FNAL/NOAO/NCSA) and all additional collaborating institutions with in-kind contributions.
3. Provide additional systems management resources at the highest level of the DES Project to ensure complete and proper delineation and integration of the three projects (DECam, Data Management, CTIO Improvements) before the next DOE/NSF review.
4. Separate into a minimum of two separately controlled documents the fundamental scientific requirements and derived technical specifications before 1 July 2007.



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## 7.3 Management Recommendations (2)

5. Develop and implement a project monitoring and control approach that may include low level milestone tracking for Data Management and CTIO Improvements that will ensure the timeliness of progress of explicitly funded and in-kind contributions that make up the balance of these two projects before the next DOE/NSF review.
6. Develop and implement an active Milestone monitoring of the DECam project and in particular in-kind contributions that includes frequent explicit monitoring of individual milestone schedule float consumption prior to the review for CD-2.
7. Consider the development of a DES Project Resources Board and coordinate its scope and direction with DOE and NSF with respect to any Joint Oversight Group (JOG) that might be formed by the next DOE/NSF review
8. Fill the systems/project engineering position within the DECam Project as soon as possible.
9. Develop explicit criteria and definitions for the end of the DECam project and its corresponding CD-4 and handoff to CTIO before the CD-2 review. Specifically, address issues of number of acceptable and installed CCDs on the focal plane and *gatepoint* criteria needed to determine when to transfer the instrument to CTIO.